

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1-7. (Canceled)

8. (Previously presented) A system for the partial oxidation of light hydrocarbons and the partial oxidation of H₂S, comprising:

a reaction zone for receiving said hydrocarbon and H₂S and oxygen and including a catalyst suitable for catalyzing the partial oxidation of said hydrocarbon and the partial oxidation of H₂S to form a product comprising CO, H₂, elemental sulfur and H₂O, and,

a cooling zone including a sulfur condenser for receiving said product from said reaction zone and removing elemental sulfur from said product.

9. (Previously presented) The system according to claim 8 comprising a mixing zone upstream of said reaction zone, said mixing zone adapted for receiving said hydrocarbon, H₂S, and oxygen gases.

10. (Original) The system according to claim 9 comprising a thermal barrier between said mixing zone and said reaction zone.

11. (Previously presented) The system according to claim 9 comprising an oxygen injection line in communication with said reaction zone.

12. (Previously presented) The system according to claim 9 comprising an oxygen injection line in communication with said mixing zone.

13-14. (Canceled)

15. (Currently amended) The system according to claim 8 comprising at least one tailgas ~~processing-converter~~ unit downstream of said sulfur condenser for removing residual sulfur from said product.

16. (Original) The system according to claim 8 wherein said catalyst is supported on a wire gauze.

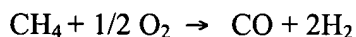
17. (Previously presented) The system according to claim 8 wherein the catalyst is selected from the group consisting of: platinum, rhodium, iridium, nickel, palladium, iron, cobalt, rhenium, rubidium, Pd-La₂O₃, Pt/ZrO₂, Pt/Al₂O₃ and combinations thereof.

18-20. (Canceled)

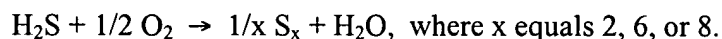
21. (Previously presented) The system of claim 8 comprising, in sequence:
a synthesis gas reactor having a light hydrocarbon gas inlet, an O₂ inlet and an H₂S inlet,
a firetube boiler for receiving gases from said reactor,
a sulfur condenser for receiving gases from said boiler and condensing elemental sulfur,
a heater for receiving gases from said condenser, and
a tailgas cleanup unit for receiving heated gases from said heater.

22. (Previously presented) The system of claim 21 further comprising, in sequence, a cooler for receiving product gas from said tailgas cleanup unit, and a quench tower.

23. (Previously presented) The system of claim 17 wherein said catalyst is capable of catalyzing the reactions



and



24. (Canceled)

25. (Currently amended) The system of claim 15 wherein said tailgas ~~processing converter~~ unit comprises a sulfur absorbing material.

26. (Previously presented) An apparatus for producing synthesis gas and elemental sulfur, the apparatus comprising:

means for effecting both the catalytic partial oxidation of a light hydrocarbon to form CO and H₂ products and the catalytic partial oxidation of H₂S to elemental sulfur and H₂O in a single reaction zone of a short contact time reactor, whereby a stream of product containing CO, H₂, H₂O and elemental sulfur is produced;

means for maintaining the temperature of said reaction zone above 500 degrees C;

means for cooling said product stream below the dewpoint of sulfur;

means for recovering condensed elemental sulfur from said cooling means; and

means for recovering a stream of desulfurized synthesis gas.

27. (Previously presented) The apparatus of claim 26 comprising means for removing residual elemental sulfur from said desulfurized synthesis gas stream.

28. (Canceled)